

not impose an obligation on the ILEC to combine elements for the entrant:

The FCC and its supporting intervenors argue that because the incumbent LECs maintain control over their networks it is necessary to force them to combine the network elements, and they believe that the incumbent LECs would prefer to do the combining themselves to prevent the competing carriers from interfering with their networks. Despite the Commission's arguments, the plain meaning of the Act indicates that the requesting carriers will combine the unbundled elements themselves; the Act does not require the incumbent LECs to do all of the work. Moreover, the fact that the incumbent LECs object to this rule indicates to us that they would rather allow entrants access to their networks than have to rebundle the unbundled elements for them.⁵

The key assumption underlying the Eighth Circuit's opinion is that an ILEC would prefer to provide the entrant access to combine network elements than to combine the elements on their behalf. This assumption has never been tested, however, because the minimally acceptable access arrangements to combine elements under the Act have not yet been defined by regulators. Although the Eighth Circuit's decision is on appeal to the Supreme Court, the full implication of this decision must be addressed in the interim so that: (a) the entrant's right to access and combine elements can be enforced, (b) local competition can proceed, and (c) the appropriate standard can be applied to any Section 271 application for in-region, interLATA authority. The core issue created by the Eighth Circuit decision is relatively straight-forward: How shall the incumbent LEC provide entrants access to combine network elements, including the recombination of previously connected elements requested by an entrant?

Before addressing the specific combination/recombination systems necessary to support *widespread* local competition, however, it is important to appreciate that the loop/switch combination is not the only critical issue. Entrants also need access to combine

⁵ Iowa Utilities Board v. FCC, 120 F.3d 753, 813 (8th Cir. 1997), cert granted. ("Iowa Utilities Board")

other network elements. For instance, some entrants require access to the combination of the loop and dedicated transport (sometimes called an "extended loop"). Other entrants will require different combinations and it is impossible to predict the combinations that will be requested in the future, as new technologies and different service innovations are introduced. As a result, there is a need to establish clear principles that will guide current and future requests for the access to combine network elements in the wake of the Eighth Circuit's decision.⁶

B. Widespread Competition Requires Automated Access to Combine Network Elements

In evaluating alternative methods to combine (and separate) network elements, it is useful to remember that the central goal of Section 251(c)(3) is to open the network to *competitors* for the benefit of *consumers*. The most important standard to judge the access that an incumbent will provide an entrant to combine elements is how well the proposed method will:

- * foster competition;
- * lower prices; and
- * provide greater choices for consumers.

In general, an access method that is nondiscriminatory should be expected to satisfy these consumer-oriented objectives as well. Because an ILEC would presumably establish

⁶ Because the loop and local switching network elements form the combination most likely to support broad-based, mass-market competition, it is this combination that provides the focal point of the white paper. The basic principles articulated here, however, apply more broadly to the ILEC's obligation to provide non-discriminatory access to combine *any* network element requested by an entrant.

combination procedures for itself that are the most efficient possible, providing entrants nondiscriminatory access to comparable procedures should also foster competition, promote lower prices and provide consumers with maximum choice. Nondiscrimination is not simply a legal requirement, it is also a standard necessary to maximize the benefits of competition for consumers.

In addition to being nondiscriminatory, the access method used to combine network elements should also have widespread application in order to maximize consumer benefits. That is, the method itself should not create entry barriers or impose unnecessary costs or delay. This criterion is also recognized by the Eighth Circuit which determined that an entrant cannot be required to own telecommunications facilities before it may use network elements to provide service:

... the plain language of subsection 251(c)(3) indicates that a requesting carrier may achieve the capability to provide telecommunications services completely through access to the unbundled elements of an incumbent LEC's network. Nothing in this subsection requires a competing carrier to own or control some portion of a telecommunications network before being able to purchase unbundled elements.⁷

Finally, it is equally important to understand one issue *not* raised by the Eighth Circuit's opinion. There should be no more debate concerning the entrant's right to provide service entirely using network elements obtained from the incumbent LEC.⁸ Therefore, the sole issue created by the Eighth Circuit's decision is not *whether* entrants can use network

⁷ Iowa Utilities Board, 120 F.3d at 814.

⁸ In Iowa Utilities Board (120 F.3d at 815) the Court made clear:

We conclude that the [Federal Communications] Commission's belief that competing carriers may obtain the ability to provide finished telecommunications services entirely through the unbundled access provisions in subsection 251(c)(3) is consistent with the plain meaning and structure of the Act.

elements in this manner, but only *how* the elements will be combined. Furthermore, because how network elements can be combined is affected by the manner in which they are originally separated, it is important that both processes (i.e., separation and recombination) be addressed together.

Overall, the above discussion provides a basic policy framework to evaluate alternative methods to access and combine network elements. The goal should be the adoption of whatever method is best suited to promote competition. Access methods should be *least-cost* and as simple, reliable and as automated as the systems used by the ILECs themselves. Any deviation from these standards will distort competition, increase prices and reduce the choices available to consumers.

C. The Core Policies of the Telecommunications Act Depend on Achieving Widespread Local Competition

One important measure of the success of the Telecommunications Act is by whether consumers actually enjoy local choices, lower prices and innovative services. Success by these metrics means that competition must not occur solely in metropolitan areas for large business customers, but must extend broadly throughout the market to average consumers, residential and small businesses alike. The level of local competition will be directly decided by the systems used to provision and combine network elements. Efficient, automated systems will promote competition; while complex and burdensome manual processes will not.

The Congressional vision of a fully competitive telecommunications market cannot be realized unless the principal means to serve the broad market -- network elements⁹ -- are

⁹ Incumbent LECs may argue that service resale -- i.e., the resale of retail services at a wholesale discount as described in Section 251(c)(4) -- is sufficient to promote widespread local competition. Such a claim, however, is false. Although service-resale may be an appropriate

provisioned with a speed and convenience comparable to the way that consumers change long distance providers today. In addition to the obvious goal of local competition itself, there are three other, interrelated, policies which can only succeed if an environment of widespread local competition is first established.

First. The Federal Communications Commission has adopted a "market-based" approach to access charge reform. The cornerstone of this policy is that prescriptive reductions in carrier access charges are not necessary because market forces will effectively discipline access prices in the future. The primary competitive substitute to access service *assumed* by the FCC, however, is the widespread availability and use of network elements:

The 1996 Act removes barriers to entry in the local market, generating competitive pressures that make it difficult for incumbent LECs to maintain access charges above economic cost. For example, by giving competitors the right to lease an incumbent LEC's unbundled network elements at cost, Congress provided IXCs an alternative avenue to connect to and share the local network.¹⁰

We [the FCC] intend instead to rely on the availability of unbundled network elements to place market-based downward pressures on access rates, subject to a prescriptive backstop.¹¹

strategy for some entrants, service-resale is deficient in a number of important respects. First, with service-resale, the entrant is effectively limited to offering the same local service as the incumbent. Second, because the entrant's price is calculated as a set discount from the incumbent's price, competition based on service-resale cannot discipline the incumbent's ability to control prices. Third, with service-resale, entrants cannot qualify for universal service support and compete on *equal* terms to the incumbent in high cost areas. Finally, service-resale does not bring any competitive discipline to access prices. Only network element-based competition can be expected to bring price and service innovation broadly to the market.

¹⁰ Access Reform Order, paragraph 32.

¹¹ Access Reform Order, paragraph 199.

... under the provisions of section 251, a competitor will be able to purchase unbundled network elements to compete with the incumbent LEC's offering of local exchange access. Therefore, so long as an incumbent LEC is required to provide unbundled network elements *quickly*, at economic cost, and in *adequate quantities*, an attempted price squeeze seems likely to induce substantial additional entry in local markets.¹²

If entrants cannot use network elements "rapidly" and in "adequate quantities" -- that is, as quickly and ubiquitously as carriers today use access services -- then network elements are not a viable substitute to access service and the FCC's access reform initiative fails. Only if systems provide entrants an automated ability to combine and use network elements to compete across the same set of customers that today obtain long distance services over switched access will network elements become the versatile entry strategy assumed by the Access Reform Order.

Second. A key criteria of the universal service system adopted by the Federal-State Joint Board is that the universal service system should be competitively neutral.¹³ Competitive neutrality means that an entrant has the same effective opportunity to win a customer and earn support (if available) as the incumbent. As the FCC stated when it extended universal service support to carriers providing service using network elements:

If we interpreted the term "own facilities" not to include the use of unbundled network elements, the end result would be that the entry strategy that includes the exclusive use of unbundled network elements would be the *only* form of entry that would not benefit from, either directly or indirectly, universal service support. A carrier that has constructed all of its facilities would certainly be eligible for support under section 214(e)(1), as would an entrant that offers service through a mix of facilities that it had constructed and resold services. A pure reseller indirectly receives the benefit of the support

¹² Access Reform Order, paragraph 279.(emphasis added).

¹³ Federal-State Joint Board on Universal Service, CC Docket No. 96-45, Recommended Decision, 12 FCC Rcd at 101 (1996).

payment, because, as discussed above, the retail rate of the resold service already incorporates the support paid to the underlying incumbent carrier. Such an environment -- in which some forms of entry are eligible for support but one form of entry is not -- is not "competitively neutral."¹⁴

The universal service reform called for by the Act can only be "competitively neutral" if entrants have a meaningful and nondiscriminatory ability to serve customers using network elements -- a result possible only if entrants have fully automated, nondiscriminatory access to combine network elements to provide service.¹⁵

Third. The competitive reason that RBOCs seek interLATA authority is because it will provide them the ability to compete offering packages of local and long distance services (i.e., to compete as a one-stop provider).¹⁶ Once an RBOC obtains the legal authority to provide in-region, interLATA services, it will be able to immediately offer one-stop packages to each and every customer in its territory.

The combined effect of a market-preference for "one stop" shopping -- and the RBOCs full participation as a one-stop full-service provider -- will have a dramatic effect on

¹⁴ In the Matter of the Federal-State Joint Board on Universal Service, First Report and Order, Federal Communications Commission Docket CC 96-45, May 5, 1997 paragraph 165. (footnotes omitted).

¹⁵ Furthermore, cost studies used to determine the potential subsidy payment only consider the cost of the network facilities/elements involved, and do not make any allowance for the higher cost that an entrant would incur to needlessly recombine elements gratuitously separated by an incumbent.

¹⁶ This characterization of the RBOC's strategic intentions is easily confirmed by their entry behavior to date. No RBOC has mounted a serious effort to compete as a conventional long distance carrier outside of its region (that is, by trying to provide long distance service to a customer obtaining local service from another ILEC). The explanation for this (non)entry pattern is simple -- without the ability to offer a *package* of local and long distance service, the RBOC has no comparative advantage in the long distance market. Of course, the reverse is equally true -- without the ability to offer local in conjunction with long distance service, (the companies formally known as) long distance carriers have no practical ability to compete against an RBOC.

the industry. The RBOC will not enter the "long distance" market so much as its interLATA participation would effectively eliminate long distance service as a separate market in its region. If others do not have the same ability to offer local service using network elements as the ILEC, then long distance competition will fail with an ILEC one-stop monopoly standing in its place.

Of course, each of the systems that will be used by the ILEC to convert customers to its long distance services are well-tested, inexpensive and fully automated (and, already paid for by the ILEC's interexchange competitors).¹⁷ If full-service competition is to become a reality, similar automated systems must provide local entrants a comparable ability to combine network elements to compete with full-service packages of their own.

¹⁷ The FCC has previously observed the disparate barriers confronting the RBOC and its local competitors and concluded:

... [the] BOCs will have access to a mature, vibrant market in the resale of long distance capacity that will facilitate their rapid entry into long distance and, consequently, their provision of bundled long distance and local service. Additionally, switching customers from one long distance company to another is now a time-tested, quick, efficient, and inexpensive process. New entrants into the local market, on the other hand, do not have available a ready, mature market for the resale of local service or for the purchase of unbundled network elements, and the processes for switching customers for local service from the incumbent to the new entrant are novel, complex and still largely untested.

In the Matter of Application of Ameritech Michigan Pursuant to Section 271 of the Communications Act of 1934, as amended, to Provide In-Region, InterLATA Services in Michigan, Memorandum Opinion and Order, Federal Communications Commission Docket CC 97-137, August 19, 1997 paragraph 17.

III. The Three Options to Combine Network Elements

A. Prohibit the Unnecessary Separation of Network Elements

As a threshold observation, it should be understood that no valid public policy is advanced by separating network elements that are currently combined. Separating network elements creates unnecessary costs that must ultimately be embedded in the prices paid by consumers. In those circumstances where a network element must be physically separated in order to effect a new configuration sought by an entrant -- for instance, where a loop is to be cross-connected to a new entrant's facilities -- then physical separation may be necessary. To demand separation simply for the sake of separation, however, wastes the resources of both the incumbent and the entrant, disrupts customers, and slows competitive activity.

Nevertheless, the Eighth Circuit has held that the federal Act sanctions the separation-for-no-purpose strategy embraced by the RBOCs. The best response to the RBOC's demand is for a state commission to determine that it has the authority under state law to require that combinations be provided without disruption. This is the path chosen by a number of state commissions, including:

Michigan: The Commission therefore concludes that the requirement to combine elements at the request of the competitive LEC is not inconsistent with Section 251(c)(3) of the federal Act and may be imposed pursuant to the provisions of state law.¹⁸

Washington: This Commission has an obligation to implement Washington statutes governing quality of service and incumbent discrimination against new entrants. To the extent those statutes create a need for incumbents to offer element combinations, the Commission must require them to offer combinations to the extent the Commission is able to do so.

The following factors [listing technical feasibility,

¹⁸ Order Adopting Arbitration Decision, Michigan PSC Case No. U-11551 at 6.

-discrimination, and quality of service] compel the Commission to resolve the pending issue in this proceeding by requiring GTE to combine elements from the Network Interface Device (NID,) to the switch[.]¹⁹

Colorado: . . . we [the Colorado PSC] determine that the Commission is empowered under State Law to require USWC to combine network elements for competitors as part of its obligations as an incumbent local exchange carrier.²⁰

Only if a state determines that it does not have independent authority to prohibit the gratuitous separation of network elements that are already combined does the issue turn to deciding what method of separation/recombination complies with federal law. Two basic approaches have been identified: (a) the manual processes and collocation forms offered by the incumbent monopolists, or (b) access to automated systems (i.e., the recent change capabilities of the local switch) requested by potential competitors.

B. The ILEC Monopoly Proposal: Manual Processes and Unnecessary Collocation

Widespread local competition -- that is, competition for average customers regardless of geographic location -- can only develop if network elements become as simple to use by an entrant as they are by the incumbent. It must be as easy for a consumer to change local carriers in the future as it is to change long distance carriers today. Importantly, the Act intended to create just such an environment by requiring that entrants be afforded access to the ILEC's network on the same basis as the incumbent.

¹⁹ Order Partially Granting Reconsideration, Washington Utilities and Transportation Commission Docket No. UT-960307, March 16, 1998, at Section IV.

²⁰ Decision Regarding Commission Authority to Require Combination of Network Elements, Docket 96S-331T, February 18, 1998, at 2-3. Although the Commission has decided it has the legal authority to require combinations, it has not yet completed the evidentiary hearings necessary to invoke the authority.

Importantly, the ILECs have largely automated their exchange networks. Indeed, a fundamental trend in telecommunications technology has been the automation of network provisioning systems. Over the past hundred years, telecommunications engineers have diligently worked to reduce potential points of failure and human intervention wherever possible. This principle was recently summarized by noted network engineer, Amos Joel before the New York PSC:²¹

A simpler network with fewer components minimizes the number of points of failure, which are places in the network where manual activity occurs and creates an opportunity for error. It also permits more efficient trouble detection, identification, and repair, improves efficiency, and lowers costs. Another important theme has been to reduce the amount of manual activity needed to make the network operate. Like unnecessary hardware, manual activity brings with it opportunity for human error, as well as increases in delay and cost, that generally can be avoided through automation.²²

It is useful to contrast this basic principle to the proposals offered by the ILECs. In response to the Eighth Circuit decision, the ILECs have offered a variety of proposals which they claim provide entrants access to combine network elements.²³ Although these proposals

²¹ Mr. Joel, formerly with Bell Labs, is a recognized expert in telecommunications network design. Mr. Joel has been President of the Institute of Electrical and Electronics Engineers (IEEE) Communications Society, and has been awarded the New Jersey Research & Development Council's Outstanding Patent Award (as a co-recipient), the IEEE Alexander Graham Bell Medal (co-recipient), the Franklin Institute-Stuart Ballantine Medal, the International Telecommunications Union Centenary Prize, the Columbian Medal, the Kyoto Prize from the Inamori Foundation of Japan, and the IEEE's Medal of Honour. In 1993, President Clinton awarded Mr. Joel the National Medal of Technology.

²² Affidavit of Amos E. Joel, Jr. Proceeding on Motion of the Commission to Examine Methods by which Competitive Local Exchange Carriers Can Obtain and Combine Unbundled Network Elements, State of New York Public Service Commission, Case 98-C-0690, paragraph 22, June 15, 1998. Affidavit sponsored by AT&T.

²³ There are differences among the RBOCs concerning which network elements they will refuse to combine on behalf of the entrant. For instance, some RBOCs are willing to combine the loop with dedicated transport (i.e., the "extended loop") while others will not. What each of the RBOCs has in common, however, is the refusal to combine the loop and local switching network elements that are the subject of this white paper.

are offered under a variety of labels -- traditional collocation, the "assembly room"²⁴ and SPOT frames²⁵ to name a few -- they are all nothing more than variations of a single theme. Each proposal involves the manual separation of the loop and local switching network elements, with the circuitous delivery of these elements to some location for recombination. The only variables in the proposals are *where* the elements would be combined, and the *type* of combining facility that the ILEC would require.

Figure 1 clearly shows that each of the ILEC's combination proposals is really the same basic configuration. Although Figure 1 is an illustrative exhibit sponsored by Bell Atlantic - New York,²⁶ its proposals are fundamentally the same as similar proposals offered under different labels by other RBOCs. Figure 1 is useful because it demonstrates that the principal entry barrier created by the ILEC proposals -- the manual disruption and manual cross-connection of network facilities on a customer-by-customer, line-by-line basis -- is *common* to each alternative.²⁷ These unnecessary steps -- and the costs associated with each -- reduce the entrant to offering hand-crafted services in competition with a fully automated incumbent.²⁸

²⁴ The "assembly room" is a proposal by Bell Atlantic - New York and is described in Appendix A.

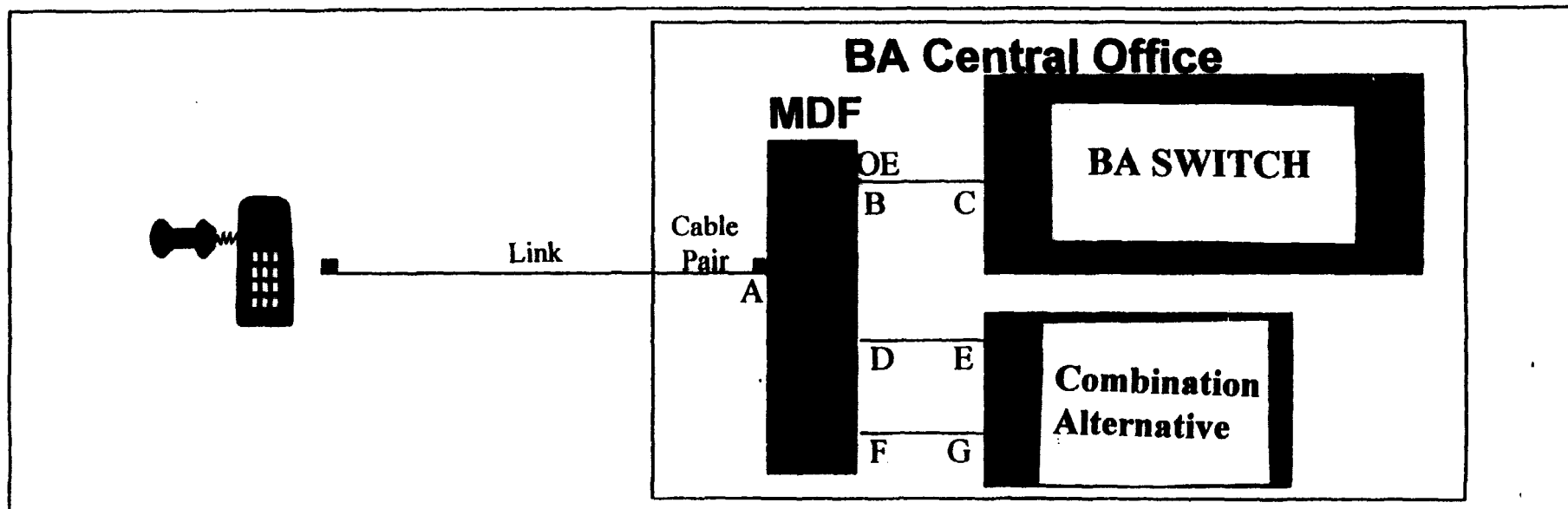
²⁵ The single-point-of-termination frame is a proposal by US WEST. See Appendix A.

²⁶ Figure 1 was sponsored by Bell Atlantic - New York (as Exhibit 1) in that Commission's investigation concerning the access that must be provide entrants to combine network elements. Proceeding on Motion of the Commission to Examine Methods by Which Competitive Local Exchange Carriers Can Combine Unbundled Network Elements, Case 98-C-0690, June 30, 1998.

²⁷ In addition to the costs and manual steps shown in Figure 1 that are *common* to each of the ILEC's proposals, there are also additional costs and steps that are *specific* to each individual method. Because the barrier created by just those unnecessary steps that are identical under each alternative is sufficient to foreclose meaningful competition, the problems associated with these additional alternative-specific steps are not addressed here.

²⁸ In the following section on recent change, Figure 2 (on page 21) contrasts these manual steps with the steps required if the automated recent change process is used to combine the loop and local switching network elements.

Conversion of existing BA-NY end user to UNEs



- 1) CLEC cross-connects for loop (F-G) and port (D-E) tie cables, are pre-wired in collocation arrangement.
- 2) BA receives one LSR including Loop and Port tie cable assignment information.

Date Due Minus Two (days)

- 1) BA frame technician confirms correct telephone number is on loop at (A).
- 2) BA frame technician lays in loop cross-connect (A-F) "dead ended" at MDF (A).
- 3) BA frame technician runs port cross-connect (B-D). Dial-tone is now bridged through CLEC collocation arrangement.

Date Due (Cutover)

- 1) BA cutover coordinator contacts frame (MDF) and RCMAC (line translations) technicians.
- 2) BA frame technician re-verifies correct telephone number is on loop at (A).
- 3A) BA RCMAC technician activates unbundled port line translations.
- 3B) BA frame technician lifts A-B connection at (A), and places cross-connect (A-F) at (A). Cutover is complete.
- 4) BA frame technician removes A-B cross connect.

Appendix A discusses in detail the various manual collocation proposals offered by the ILECs, and more fully identifies the core discrimination embedded in each. Although these proposals may differ in detail, they all display the same discrimination: each requires the manual handling of two network elements (the local switch and local loop) that would be electronically reconfigured if that same customer chose the ILEC.²⁹

The manual collocation proposals offered by the ILECs adversely effect local competition. As Appendix A explains, these proposals would:

- (1) impose unnecessarily prolonged service interruptions for customers when they change to a CLEC as their local service provider;
- (2) delay the CLECs ability to enter the market via network element combinations;
- (3) degrade the quality of the end user customer's service;
- (4) impose wasteful and unnecessary costs on CLECs; and
- (5) severely restrict the rate at which CLECs could switch customers over to UNE-based service after the collocation arrangement is established.

²⁹ Generally, the only time that an ILEC manually configures a premises' loop and switch connection is when the facilities are initially installed. This non-recurring event can continue to be performed by an ILEC even in an unbundled network element context since the functionality of the elements is not established by this physical connection. Alternatively, in those instances where an initial connection has not yet been established, an ILEC could provide the serving-entrant access to establish the initial connection with a right to recover this non-recurring cost from future entrants serving that premise. Since such an approach raises administrative difficulties (and costs) that are not necessary, this is not the alternative that CompTel recommends.

Manual combination systems are inherently more costly and less reliable than electronic systems. Manual systems maximize the potential for human error by relying on human intervention with each customer change. This reliance introduces costs that are unnecessary and reduces reliability and quality of service for consumers. Furthermore, manual systems slow entry by introducing time and labor requirements that are inconsistent with widespread entry. Finally, they unnecessarily increase the rates paid by consumers for competing local exchange service.

No manual process to combine the loop/switch network elements will ever satisfy the Act's requirement of nondiscrimination, nor would it ever support the form of mass-scale entry and competition necessary for entrants to compete with an ILEC's ability to offer interLATA services. Customers expect and deserve the ability to rapidly obtain telecommunications services from the providers of their choice, with a minimum of inconvenience and cost. Only an automated process can satisfy this expectation. Fortunately, just such a process is in use today that can be easily modified to accommodate this need.

C. The Competitive Alternative: The Electronic Application of Recent Change

The only identified method to combine the loop and local switch elements that: (a) is nondiscriminatory, (b) can accommodate the millions of requests each year that will occur in a competitive local exchange market, and (c) does not unlawfully impose a facilities-requirement in violation of the Eighth Circuit, is an electronic method which relies on the use of the "recent change" capability of the local switch to separate and recombine the loop and local switch network elements. By modifying existing software which today is used to provide large Centrex customers with access to recent change, this same software-based system can be used by entrants to combine the loop and local switching network elements. The specific details of the recent change process are described in Appendix B.

In summary form, the principal benefit of the recent change approach is that it can fully automate the combining of the loop and local switching network elements so central to widespread local competition. Under the ILEC's combination proposals, the ILEC alone is able to combine elements and provide service using automated systems -- entrants are relegated to manual processes fraught with human intervention. The recent change proposal, however, builds upon existing software to create a software-based alternative that is comparable to the access that the ILEC provides itself.

The recent change system is used by the ILECs today to update and assign the features and functions of the local switch. For instance, the recent change process is used by the ILEC when a new customer occupies an existing premise. Typically, physical facilities are installed to serve a particular premise, independent of its current occupant. As customers come and go, these physical facilities are not disrupted. Rather, the incumbent electronically defines the current occupant's service.³⁰

This same process can be used to provision the loop and local switching network elements to a new entrant. The recent change process can electronically separate the functionality of the local switch from the functionality of the local loop.³¹ In this way, the ILEC's legal right to separate the elements is honored, but the separation occurs in the most efficient manner possible. Then the same process can be used by the CLEC's provisioning system to recombine these elements, restoring service to the consumer with the least cost and

³⁰ For instance, Bell Atlantic has testified that for customers who wish to terminate service, Bell Atlantic typically issues and provisions a service disconnection order using purely electronic means, and when a new customer moves into a location after a disconnect order has been implemented and orders basic service, no human being has to do anything to complete the provisioning of the service request. See Testimony of Thomas M. Aulio, Bell Atlantic, Massachusetts Department of Public Utilities, DPU 96-73/74, et. al., December 4, 1997. pp. 28-33.

³¹ Appendix C explains the legal sufficiency of the recent change process to unbundle the local loop and local switching network elements.

minimal disruption. The nondiscrimination standard is satisfied because similar systems are used whether the customer chooses the entrant or the incumbent.

Furthermore, the recent change alternative is inherently more efficient and less costly than the manual systems being proposed by the ILECs. Figure 2 below contrasts the *total* steps needed to combine network elements using recent change with those steps that are *common* to each of the proposals of the ILECs.³² As shown in Figure 2, the recent change option eliminates 12 manual steps and substitutes a single electronic event.

By relying of automated, software-based systems to separate and recombine network elements, the recent change alternative is capable of providing customers the same service intervals when they change local carriers as they today enjoy when changing long distance carriers. Achieving such parity is not only sound policy because it promotes fair competition between today's long distance carriers and the incumbent LEC in the full service marketplace, but it is also necessary to satisfy an important FCC rule applicable to the local switching network element, 47 C.F.R. § 51.319(c)(1)(ii):

An incumbent LEC shall transfer a customer's local service to a competing carrier within a time period no greater than the interval within which the incumbent LEC transfers end users between interexchange carriers, if such transfer requires only a change in the incumbent LEC's software.

Of course, because each of the ILEC's proposals requires multiple manual steps to combine elements, the ILEC proposals would allow them to avoid this rule and thus assure that it would always be simpler for a customer to move its long distance service to the ILEC than to change its local service to its current long distance provider.

³² The steps in Figure 2 are developed from the Bell Atlantic - New York exhibit explained in the previous section (shown as Figure 1). As discussed, the listed steps are only those activities which are common to each of the ILEC proposals -- in addition to these steps, each ILEC alternative has other unique requirements that are avoided by recent change.

Figure 2
Comparing the Efficiency/Reliability of the Manual ILEC Proposals
to the Automated Recent-Change Process

	ILEC Proposals		Recent Change	
Activity Conversion Steps From Figure 1	Nature of Activity	Who	Nature of Activity	Who
1a Cable DE Installed	Manual	ILEC	Not Needed	
1b Cable FG Installed	Manual	ILEC		
1c XConnect EG Prewired	Manual	CLEC		
2 ILEC receives LSR	Same process under either method			
Date Due Minus Two Days				
1 Technician confirms NNX-XXXX	Manual	ILEC	Not Needed	
2 Technician lays Xconnect AF	Manual	ILEC		
3 Technician lays Xconnect BD	Manual	ILEC		
Cutover				
1a Cutover Coordinator contacts MDF technician	Manual	ILEC	Not Needed	
1b Cutover Coordinator contacts RCMAC technician	Manual	ILEC		
2 Technician reconfirms NNX-XXXX	Manual	ILEC		
3a Recent Change separates loop functionality from switch functionality.			Electronic	ILEC
3b Recent Change activates line translations for unbundled local switching network element (combining loop functionality with switch functionality).	Electronic	ILEC	Electronic	CLEC
3c Technician lifts connection AB	Manual	ILEC	Not Needed	
3d Technician Xconnects AF	Manual	ILEC		
4 Technician removes AB XConnect	Manual	ILEC		

In addition to being more efficient and nondiscriminatory, adapting the recent change process to the purpose of combining the loop and local switching network elements is also a logical next step to implementing the overall framework of the Act. First, entrants are *already* entitled to access the recent change process because it is a inherent capability of the local switch:

CFR § 51.319 (c)(1)(i) -- Local Switching Capability

- (C) all features, functions, and capabilities of the switch, which include, but are not limited to:
 - (1) the basic switching function of connecting lines to lines, lines to trunks, trunks to lines, and trunks to trunks, as well as the same basic capabilities made available to the incumbent LEC's customers, such as a telephone number, white page listing, and dial tone; and
 - (2) all other features that the switch is capable of providing, including but not limited to custom calling, custom local area signaling service features, and Centrex, as well as any technically feasible customized routing functions provided by the switch.³³

Processes required to access the recent change capability of the switch also are part of the operations support systems (OSS) network element. In the environment which preceded the Eighth Circuit's decision, the FCC had determined that entrants only required indirect access to the recent change process -- i.e., that the entrant would request the activation/deactivation of features, functions and capabilities of the switch, while the ILEC would process the actual request.³⁴ The Eighth Circuit's view that the incumbent LEC should not "do all the work," however, now means that entrants should be provided a direct mechanism to effect changes in their subscribers' services by directly accessing the network

³³ 47 C.F.R. § 51.319(c)(1)(i)(C).

³⁴ Interconnection Order at para. 415.

elements they have obtained for the ILEC. Recent change accomplishes this result.

Second, the need to modify recent change software so that entrants would have direct access to define their own customers' services would have arisen eventually, even if the Eighth Circuit had not created an immediate need to provide entrants access to combine network elements. As local competition develops, it is reasonable to expect that entrants would seek improvements in switch software to gain greater autonomy from their incumbent rival.³⁵ The use of recent change as a method to combine network elements may have accelerated this trend, but its end result -- the entrant having an ability to control its customers' services without interference from the ILEC -- is the inevitable consequence of creating a nondiscriminatory local switching network element that treats all providers the same.

Third, the ILECs have already shown that the recent change process can be selectively opened because they today allow some *customers* this access to configure their own Centrex services. It is now time that the same approach can be modified to provide *competitors* access to their subscribers. Furthermore, at least one vendor has indicated that it could quickly -- i.e., within six months -- develop software that would work with existing ILEC systems.³⁶ The issue is not whether the recent change process *can be* opened, the only question is whether it *will*.

Finally, the recent change alternative is the only alternative compatible with

³⁵ Improving switch software has been central to the development of competition. Equal access essentially made one function of the local switch -- its use to originate/terminate long distance traffic -- available to multiple carriers. IntraLATA equal access applied this same principle to a larger base of traffic. Providing entrants direct control of the recent change process for their own customers is simply an extension of the underlying trend to redefine the local switch as a common resource that "houses" more than one competitor.

³⁶ See Presentation of COMMTECH Corporation, Open Forum Concerning Methods to Combine Network Elements, Federal Communications Commission, June 4, 1998.

integrated digital loop carrier (IDLC) technology. IDLC technology is the forward-looking technology being deployed in the network today. Because IDLC integrates the loop directly into the switch, no physical separation is possible. The only way to separate the loop and switch network elements using this technology is the electronic separation accomplished using recent change.

There is no question that the recent change approach is the most efficient, pro-competitive, alternative. The method is nondiscriminatory because it allows an entrant to serve a customer using the same systems used by the incumbent. The method is electronic and can be easily scaled to support the commercial volumes expected in a successfully competitive market. And the method is the least-cost alternative because its per-transaction cost should be trivial.³⁷

Because of these inherent advantages, the Texas Commission has recently ordered Southwestern Bell to offer a recent-change based method to combine the loop and local switching network elements.³⁸ In contrast, *no* state commission has concluded that the ILEC's manual systems and unnecessary collocation requirements satisfy their obligation to provide entrants nondiscriminatory access to combine elements.³⁹

Recent change is the only means of combining network elements that satisfies both

³⁷ There will be non-recurring costs to make the one-time changes in software to open the recent change process to competitors. These one-time costs are estimated at approximately \$3 million per RBOC (see Appendix B). As noted earlier, however, these costs would be inevitable to establish a nondiscriminatory local switching network element and would be small when recovered on a per-transaction basis over a reasonable amortization period.

³⁸ Investigation of southwestern Bell Telephone company's Entry into the Texas InterLATA Telecommunications Market, Order No. 25 Adopting Staff Recommendations and Directing Staff to Establish Collaborative Process, Public Utility Commission of Texas, Project No. 16251, June 1, 1998, at 4.

³⁹ For a fuller discussion of the legal deficiencies of the ILEC proposals and state decisions see pages 4-6 of Appendix C.

the requirements of the 1996 Act and the holdings in Iowa Utilities Board v. FCC.⁴⁰ The recent change process is an existing, well-established functionality of the ILECs' local switching network element. Requesting carriers have the right to use these capabilities for any purpose including for the purpose of combining network elements.⁴¹

Significantly, there is nothing in the federal Act, industry precedent or the FCC's Interconnection Order to support the proposition that unbundling requires the *physical* separation of network elements. Network elements in general, and the unbundled local switching network element in particular, are defined by their *functionality*. Unbundling occurs when the *functionality* of one element is separated from the *functionality* of another. Recent change separates the functionality of the local switch from the functionality of the local loop in the most efficient manner possible, thereby satisfying the Department of Justice's requirement that ILECs who choose to separate network elements should be required to do so in a manner that permits the most efficient recombination of those elements and minimizes the costs imposed on CLECs.⁴²

In contrast, limiting CLECs to collocation and other manual methods of combining network elements, violates both the Act and the Eighth Circuit's decision. The ILEC's proposals discriminate against competitors by imposing on them costs, difficulties, delays, and other limitations not incurred or experienced by the ILECs when they provide service over the same network elements. Further, these proposals impose on the CLEC a facilities-requirement that squarely contradicts the Eighth Circuit's admonition that no such

⁴⁰ Iowa Utilities Board v. FCC, 120 F.3d 753 (8th Cir. 1997), *cert. granted*.

⁴¹ 47 C.F.R. § 51.309(a) ("An incumbent LEC shall not impose limitations, restrictions, or requirements on requests for, or the use of, unbundled network elements that would impair the ability of a requesting telecommunications carrier to offer a telecommunications service in the manner the requesting telecommunications carrier intends.").

⁴² Letter from Joel L. Klein, Assistant Attorney General, Department of Justice, Antitrust Division, to John O'Mara, Chairman, New York Public Service Commission, dated April 6, 1998, at 2 ("Letter from Joel Klein").

requirement exists in the law.

Appendix C provides a detailed discussion of the legal basis for using the recent change process to separate and combine network elements. In addition, the Appendix addresses the legal deficiencies of the manual processes and unnecessary collocation requirements common to the ILEC proposals. To summarize, recent change is the right policy choice, it is the right legal choice and it is the only choice to efficiently and rapidly achieve widespread local competition.

V. Summary and Conclusion

The fundamental intent of the Telecommunications Act of 1996 is a robustly competitive local exchange market. The principal tool to achieve this end is providing entrants the same right to provide service using the incumbents network as the incumbent itself. For this vision to become a reality, however, the ordering, provisioning and *combination* of network elements must be as straightforward for the entrant as the incumbent.

Two diametrically opposed approaches have been proposed to provide entrants access to combine the loop and local switching network elements so central to widespread local competition. In one corner are the proposals offered by the incumbent monopolists. These proposals -- offered under differing labels, but material identical in all important respects -- require unnecessary and costly collocation arrangements and rely on repetitive manual processes at odds with a modern network architecture. In response, competitors have recommended an electronic alternative that would simply extend to new entrants access to the recent change process that the ILEC's use themselves and which they have already made available to their largest (i.e., Centrex) customers.

The clear dichotomy between these proposals was eloquently summarized by Mr.

Joel:

Having reviewed the MDF [i.e., collocation] and the recent change methods proposed for combining network elements, for me, the choice among them is clear cut. I cannot recommend using the various MDF jumper methods to separate and recombine network elements. Those methods add significant amounts of manual processing and rely heavily on outdated equipment. At best, they would make the network less reliable, delay provisioning, and add needless cost; they also seem unlikely to be able to support an active, competitive market. Given the long history of efforts by engineers to eliminate manual processes and replace reliance on equipment with reliance on software, the MDF jumper methods will impose upon CLECs trying to compete in the 21st century a network design based upon 19th century ideas. Because it does not further any of the criteria for evaluating changes in network design, but actually undermines them, it is not an acceptable engineering solution.

The recent change process, by contrast, seeks to capitalize on the improvements and efficiencies engineers have introduced into the network. As a solution that takes advantage of the enhanced functionality of the switch made possible by stored program control, it is consistent with current approaches to network engineering. It is more reliable, more functional, and more efficient than the MDF approach, and is therefore, in every important respect, a preferable solution. Moreover, it will allow CLECs to use the same software-based tools to combine elements that Bell Atlantic [and other ILECs] and its customers use today.⁴³

To achieve widespread competition requires that the automated recent change process be made available to local entrants to combine network elements. Only in this way will the fundamental purpose of the Act -- lower local prices, greater local choices and innovative local products - become a reality.

⁴³ Affidavit of Amos E. Joel, Jr. Proceeding on Motion of the Commission to Examine Methods by which Competitive Local Exchange Carriers Can Obtain and Combine Unbundled Network Elements, State of New York Public Service Commission, Case 98-C-0690, paragraphs 59 and 60, June 15, 1998. Affidavit sponsored by AT&T. For a summary of Mr. Joel's qualifications, see footnote 21.

